

# NASA TECH BRIEF

## Lewis Research Center



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### Computer Program for Transient Response of Structural Rings Subjected to Fragment Impact

This computer program (JET 3) predicts the transient responses of a complete or partial ring with various support conditions and restraints. The ring may be subjected to arbitrary distributions of initial impulse loading and/or externally-applied time-dependent forces. The geometrical shapes of the structural ring can be simple, circular or arbitrarily curved and with variable thickness along the circumferential direction. Strain-hardening and strain-rate sensitive material behavior are taken into account.

The computerized model can be used by designers who, knowing the physical, operational, and environmental characteristics of a turbomachine and a proposed containment/deflection system, could mathematically evaluate the combined package, under a variety of possible burst attacks, on the computer (assuming that one has an adequate description of the forces which the fragments apply to the containment ring); instead of in a spin chamber. The mathematical optimization of a containment/deflection system would save a great deal of time, effort, and material as well as afford the designer a greater opportunity to investigate new ideas and a variety of materials.

#### Notes:

1. This is the third in a series of computer programs which are available for use in analyzing structures such as protective rings to contain/deflect fragments generated by burst engine rotors. Each of these programs requires that the forces applied to the structure be prescribed. The two earlier programs are also available from COSMIC (address below), References: LEW-11389 and LEW-11668.
2. The program is written in FORTRAN IV for the IBM 370/155.
3. Inquiries concerning this program should be directed to:

COSMIC  
Information Services  
112 Barrow Hall  
University of Georgia  
Athens, Georgia 30602  
Reference: LEW-11926

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